

**WHAT IS CLAIMED IS:**

1. An apparatus, comprising:
  - a substrate;
  - a first conductive alignment region on the substrate;
  - a second conductive alignment region on the substrate;
  - a carbon nanotube on the substrate, the carbon nanotube having a first end portion proximate to the first conductive alignment region on the substrate, the carbon nanotube further having a second end portion proximate to the second conductive alignment region;
  - a first conducting contact region separate from the first conductive alignment region, the first conducting contact region in communication with the first end portion; and
  - a second conducting contact region in communication with the second end portion.
2. The apparatus of claim 1, wherein the carbon nanotube has a length  $L$ , and wherein the first conductive alignment region and the second conductive alignment region are separated by a distance about equal to  $L$ .
3. The apparatus of claim 2, further including a plurality of other carbon nanotubes having a length  $L$  positioned on the substrate.

4. The apparatus of claim 3, wherein a first end of each of the plurality of other carbon nanotubes is proximate to a conductive alignment region, and wherein a second end of each of the plurality of other carbon nanotubes is proximate to another conductive alignment region.

5. The apparatus of claim 1, wherein the carbon nanotube is included in a channel region of a transistor and wherein the carbon nanotube has a first conductivity type.

6. The apparatus of claim 5, wherein the first end of the carbon nanotube is proximate to a source region of the transistor, the source region having a second conductivity type, and wherein the second end of the carbon nanotube is proximate to a drain region of the transistor having the second conductivity type.

7. The apparatus of claim 6, wherein the first conductivity type is p-type and the second conductivity type is n-type.

8. The apparatus of claim 6, wherein the first conductivity type is n-type and the second conductivity type is p-type.

9. The apparatus of claim 6, further including a gate region and a gate oxide region, the gate oxide region positioned at least partially between the carbon nanotube and the gate region, and wherein the carbon nanotube is responsive to a gate voltage applied to the gate region.

10. The apparatus of claim 9, wherein the gate comprises a nanotube.

11. The apparatus of claim 9, wherein the gate comprises a material selected from the group consisting of polysilicon, titanium nitride, rubidium, cobalt, nickel, and aluminum.

12. The apparatus of claim 5, wherein the channel region further includes another carbon nanotube.

13. The apparatus of claim 1, wherein the carbon nanotube is included in an interconnect layer of an integrated circuit.

14. An apparatus, comprising:

- a device substrate;
- a plurality of devices patterned on the device substrate;
- a plurality of device interconnection regions positioned on the device substrate, each of the plurality of device interconnection regions in communication with one or more of the plurality of devices; and
- a carbon nanotube having a first end in communication with one of the plurality of device interconnection regions.

15. The apparatus of claim 14, further comprising a package substrate having a package connection region associated with the one of the plurality of device interconnection regions, and wherein a second end of the carbon nanotube is in communication with the package connection region.

16. The apparatus of claim 14, further including a plurality of other carbon nanotubes, each of the plurality of other carbon nanotubes having a first end in communication with one of the plurality of device interconnection regions.

17. The apparatus of claim 16, wherein each of the plurality of other carbon nanotubes has a second end in

communication with an associated one of a plurality of other package connection regions.

18. The apparatus of claim 14, wherein the first end of the carbon nanotube is further in communication with a catalyst material region.

19. A method, comprising:

applying a positive voltage to a first portion of a conductive alignment pattern on a substrate;

applying a negative voltage to a second separate portion of the conductive alignment pattern on the substrate;

providing a plurality of pre-fabricated carbon nanotubes to the substrate; and

aligning the plurality of pre-fabricated carbon nanotubes with an electric field generated by the positive voltage and the negative voltage.

20. The method of claim 19, wherein the plurality of pre-fabricated carbon nanotubes are functionalized so that a first end of each of the plurality of pre-fabricated carbon nanotubes is positively charged and a second end of each of the plurality of pre-fabricated carbon nanotubes is negatively charged.

21. The method of claim 19, further including forming a contact layer over at least some of the conductive alignment pattern.

22. The method of claim 19, further comprising forming one or more devices incorporating one or more of the plurality of nanotubes.

23. The method of claim 22, further comprising removing one or more extraneous nanotubes of the plurality of nanotubes, the one or more extraneous nanotubes not incorporated in the one or more devices.

24. The method of claim 23, wherein the removing one or more extraneous nanotubes comprises selectively etching material including the one or more extraneous nanotubes from the substrate.

25. The method of claim 19, further comprising covering one or more extraneous nanotubes of the plurality of nanotubes, the one or more extraneous nanotubes not incorporated in the one or more devices.

26. The method of claim 25, wherein the covering one or more extraneous nanotubes comprises depositing an oxide layer over a region of the substrate including the one or more extraneous nanotubes.

27. A method, comprising:  
providing a plurality of nanotubes to a surface of a substrate;  
aligning N nanotubes of the plurality of nanotubes on the surface of the substrate; and  
forming device structures including M<N of the N nanotubes.

28. The method of claim 27, further comprising generating an electric field on the substrate, and wherein aligning the N nanotubes comprises aligning the N nanotubes with the electric field.

29. The method of claim 27, further comprising removing N-M of the N nanotubes.

30. The method of claim 27, further comprising covering N-M of the N nanotubes with a material.

31. The method of claim 27, further comprising functionalizing the N nanotubes to have a first positively charged end region and a second negatively charged end region.

32. The method of claim 27, further comprising separating the N nanotubes from  $P > N$  nanotubes.

33. The method of claim 32, wherein separating the N nanotubes comprises separating the N nanotubes based on an electromagnetic characteristic of the N nanotubes.